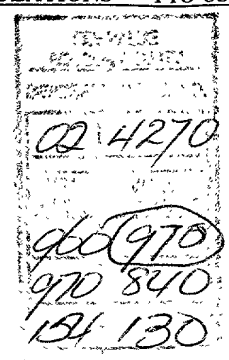
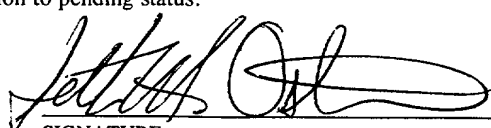


COMPUTER GENERATED FORM PTO-1390 (REV 10-97)		U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE	ATTORNEY'S DOCKET NO. 3315/23
TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED /ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371			U.S. APPLICATION NO. (if known, see 37 CFR 1.53) <b>09/509265</b>
INTERNATIONAL APPLICATION NO. PCT/GB99/02403	INTERNATIONAL FILING DATE July 23, 1999	PRIORITY DATE CLAIMED July 25, 1998	
TITLE OF INVENTION IDENTIFICATION AND COMMUNICATION SYSTEM FOR INFLATABLE DEVICES			
APPLICANT(S) FOR DO/EO/US Michael David NEWTON			
Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:			
<ol style="list-style-type: none"> <li><input checked="" type="checkbox"/> This is a <b>FIRST</b> submission of items concerning a filing under 35 U.S.C. 371.</li> <li><input type="checkbox"/> This is a <b>SECOND</b> or <b>SUBSEQUENT</b> submission of items concerning a filing under 35 U.S.C. 371.</li> <li><input checked="" type="checkbox"/> This express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).</li> <li><input type="checkbox"/> A proper Demand for International Preliminary Examination was made by the 19<sup>th</sup> month from the earliest priority date.</li> <li><input checked="" type="checkbox"/> A copy of the International Application as filed (35 U.S.C. 371(c)(2)) <ol style="list-style-type: none"> <li><input type="checkbox"/> is transmitted herewith (required only if not transmitted by the International Bureau).</li> <li><input checked="" type="checkbox"/> has been transmitted by the International Bureau.</li> <li><input type="checkbox"/> is not required, as the application was filed in the United States Receiving Office.</li> </ol> </li> <li><input type="checkbox"/> A translation of the International Application into English (35 U.S.C. 371(c)(2)).</li> <li><input checked="" type="checkbox"/> Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3)) <ol style="list-style-type: none"> <li><input type="checkbox"/> are transmitted herewith (required only if not transmitted by the International Bureau).</li> <li><input type="checkbox"/> have been transmitted by the International Bureau.</li> <li><input type="checkbox"/> have not been made; however, the time limit for making such amendments has NOT expired.</li> <li><input checked="" type="checkbox"/> have not been made and will not be made.</li> </ol> </li> <li><input type="checkbox"/> A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).</li> <li><input checked="" type="checkbox"/> An unexecuted oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).</li> <li><input type="checkbox"/> A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).</li> </ol>			
Items 11. To 16. below concern document(s) or information included:			
<ol style="list-style-type: none"> <li><input type="checkbox"/> An Information Disclosure Statement under 37 CFR 1.97 and 1.98.</li> <li><input type="checkbox"/> An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.</li> <li><input checked="" type="checkbox"/> A <b>FIRST</b> preliminary amendment. <input type="checkbox"/> A <b>SECOND</b> or <b>SUBSEQUENT</b> preliminary amendment.</li> <li><input type="checkbox"/> A substitute specification.</li> <li><input type="checkbox"/> A change of power of attorney and/or address letter.</li> <li><input type="checkbox"/> Other items of information:</li> <li><input checked="" type="checkbox"/> The following fees are submitted:</li> </ol>			

410 Rec'd PCT/PTO 24 MAR 2000

U.S. APPLICATION NO. (if known) <b>097/509265</b> CFR 1.5		INTERNATIONAL APPLICATION NO. PCT/GB99/02403		ATTORNEY'S DOCKET NO. 3315/23	
<b>BASIC NATIONAL FEE ( 37 CFR 1.492(a) (1)-(5) ):</b>  Search Report has been prepared by the EPO or JPO ..... \$840.00  International preliminary examination fee paid to USPTO (37 CFR 1.482) ..... \$720.00  No international preliminary examination fee paid to USPTO (37 CFR 1.482) But international search fee paid to USPTO (37 CFR 1.445(a)(2)) ..... \$760.00  Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO ..... \$970.00  International preliminary examination fee paid to USPTO (37 CFR 1.482) And all claims satisfied provisions of PCT Article 33(2)-(4) ..... 96.00				<b>CALCULATIONS PTO USE ONLY</b>  	
<b>ENTER APPROPRIATE BASIC FEE AMOUNT =</b>				\$970.00	
Surcharge of \$130.00 for furnishing the oath or declaration later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 Months from the earliest claims priority date (37 CFR 1.492 (e))				\$0	
Claims	Number Filed	Number Extra	Rate		
Total claims	15-20 =		x \$18.00	\$0	
Independent claims	3-3 =	7	x \$78.00	\$0	
MULTIPLE DEPENDENT CLAIMED (if applicable)				+ \$260.00	
<b>TOTAL OF ABOVE CALCULATIONS =</b>				\$	
Reduction of 1/2 for filing by small entity, if applicable. Verified Small Entity Statement must also be filed (Note 37 CFR 1.9, 1.27, 1.28)				\$	
<b>SUBTOTAL =</b>				\$970.00	
Processing fee of \$130.00 for furnishing the English translation later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(f))				\$	
<b>TOTAL NATIONAL FEE =</b>				\$	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property				\$	
<b>TOTAL FEES ENCLOSED =</b>				\$970.00	
				Amount to be refunded	\$
				charged	\$
<p>a. <input checked="" type="checkbox"/> A check in the amount of <u>\$970.00</u> to cover the above fees is enclosed.</p> <p>b. <input type="checkbox"/> A check in the amount of \$ <u>      </u>.00 to cover the assignment fee is enclosed.</p> <p>c. <input type="checkbox"/> Please charge my Deposit Account No. <u>02-4270</u> in the amount of \$ <u>          </u> to cover the above fees.          A duplicate copy of this sheet is enclosed.</p> <p>d. <input checked="" type="checkbox"/> The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any          overpayment to Deposit Account No. <u>02-4270</u>. A duplicate copy of this sheet is enclosed.</p> <p>NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR          1.137(a) or (b)) must be filed and granted to restore the application to pending status.</p> <p>SEND ALL CORRESPONDENCE TO:</p> <p>Brown Raysman Millstein Felder &amp; Steiner LLP          120 West 45<sup>th</sup> Street          New York, New York 10036          (212) 944-1515</p> <div style="text-align: right; margin-top: 20px;">           SIGNATURE          Seth H. Ostrow          NAME          37,410          REGISTRATION NUMBER       </div>					

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Michael David NEWTON  
Int'l. Appl. No.: PCT/GB99/02403  
Int'l. Filing Date: July 23, 1999  
U.S. Serial No.: To be assigned  
U.S. Filing Date: Concurrently herewith  
Title: IDENTIFICATION AND COMMUNICATION SYSTEM  
FOR INFLATABLE DEVICES

Assistant Commissioner for Patents  
Washington, D.C. 20231

**PRELIMINARY AMENDMENT**

Sir:

Concurrently with the filing of the above-referenced application and prior to the substantive examination thereof, please amend the above-referenced application as follows:

**IN THE SPECIFICATION**

Page 1, after line 1, insert --BACKGROUND OF THE INVENTION--.

Page 2, after line 10, insert --SUMMARY OF THE INVENTION--;

line 20, change "Accordingly, the present" to --The present--.

Page 8, after line 8, insert --BRIEF DESCRIPTION OF THE DRAWINGS--.

Page 8, after line 20, insert --DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS--.

**IN THE CLAIMS**

Page 15, line 1, delete "Claims:" and insert --WHAT IS CLAIMED IS--.

Please amend the claims as follows:

Claim 1, line 5, after "therethrough," insert --and--; and

line 8, before "capable" insert --is--.

Claim 2, line 5, after "operate" insert --the pump to effect--; and  
line 6, delete "accordingly".

Claim 3, lines 1-2, change "claims 1 or 2" to --claim 1--.

Claim 4, lines 1-2, change "claims 1, 2 or 3" to --claim 1--.

Claim 5, line 3, after "the pump" insert --and--; and  
line 7, after "communication means" insert --is--.

Claim 7, lines 1-2, delete "or 6".

Claim 8, line 7, after "communication means" insert --is--; and  
line 9, delete "accordingly".

Claim 10, lines 1-2, delete "or 9".

#### REMARKS

After entry of this amendment to, among other things, eliminate multiple dependent claims, it is believed that the above-referenced application is ready for substantive examination by the Examiner. Early and favorable examination thereof is, therefore, respectfully requested.

In the event that additional cooperation in this case may be helpful to complete its prosecution, the Examiner is cordially invited to contact Applicants' representative at the telephone number listed below.

The Commissioner is hereby authorized to charge any insufficient fees or credit



IDENTIFICATION AND COMMUNICATION SYSTEM FOR INFLATABLE DEVICES

This invention relates to pneumatic systems and in particular to pneumatic systems having an inflatable/deflatable article connected to a fluid source, for example a pump.

It is known for such systems to have a coupling assembly connecting the article to the fluid source, the coupling assembly comprising a male insert and a cooperating female receptacle for receiving the male insert so as to form a coupled state. The male insert or female receptacle includes a mechanical latch cooperating with a cavity on a corresponding surface of the other for mechanically latching and unlatching the coupling assembly, the male insert member and the female receptacle both defining a pathway for the flow of fluid through it when in the coupled state. A seal member extends between the male insert member surface and the surface of the female receptacle to provide a fluid tight seal when in the coupled state.

WO96/14785 describes a pneumatic system comprising an inflatable mattress connected to a pump by a connector mounted on the end of a fluid line from the inflatable mattress, the connector being mechanically inoperable upon disconnection with the pump. In this way, the connector ensures that the inflatable mattress is used only once, for reasons of clinical safety.

However, such pneumatic systems of the prior art including connectors that prevent re-use are not able to distinguish between different articles to be inflated or different pumps.

Modern technology has now made it possible to design a pump to be programmable so that a number of different inflatable articles with differing inflating and/or deflating arrangements fulfilling totally different functions may be attached to a physically identical pump. Thus, there is a need for an intelligent means associated with the pump and/or the article able to identify or distinguish between the pump and the article connected, and further to control the operation of the pump appropriate to the article connected.

Accordingly, the invention provides a pneumatic control system including a pump and at least one inflatable/deflatable article, control means for operation of the pump, connection means for connecting the article and pump for fluid flow therethrough, communication means provided on each of the pump and article, wherein upon connection between the pump and article at least one of said communication means capable of identifying the article and instructing the control means to activate the pump accordingly.

Preferably, the communication means are capable of exchanging information or energy so as to identify the article as that compatible to the pump and more preferably instruct the pump control means to operate a predetermined inflation and/or deflation of the article.

The information exchange between the article and the pump may comprise information contained in the article communication means being read by the pump communication means and used by the pump control means to operate the pump, or information contained in the article communication means being read by the pump communication means, and information modified/generated within the pump

communication means being stored within the article  
communication means during use. The information exchange  
may be by means of an energy source which may include but  
not be limited to electrical, pneumatic, acoustic,  
5 magnetic, electromagnetic or optical signals.

The modified information or energy transmitted to  
the pump is used to identify the article and thereafter  
used to control the pump operation either without user  
interface or to signal the user to operate the pump as  
10 indicated. Thus, operation of the pump may be altered  
automatically to match the requirements of the article to  
be inflated/deflated and its application.

Preferably, the information may include specific  
information, i.e. codes, to identify the article and/or  
15 its mode of operation (including pressure and flow versus  
time profile, and alarm settings) and/or security  
markings, to prevent unauthorised use.

In a preferred embodiment, the communication means  
on the article is located within the connection means  
20 connecting the article to the pump. Preferably, during  
use the respective communication means do not contact  
each other.

Examples of information contained within the article  
communication means may include some or all of the  
25 following data:-

(i) Article serial number - for traceability  
in the event of customer complaint, product modification,  
recall or product ownership.

(ii) Article manufacturing date - the pump  
30 communication means can automatically infer that an  
article with a limited storage time from manufacture to  
use is out of time and therefore will not operate the



pump, indicating so on the operator panel. This would be relevant to the case of single use sterile articles where the sterile packaging has a limited lifetime.

(iii) Article type information - the pump communication means reads the code and identifies the code as that to be used by the pump and sets up the correct pressure and flow versus time profiles on the air delivery paths automatically. Also the communication means on the pump can indicate to the user on the pump operator panel which application or applications the pump/article combination is intended for.

(iv) Single use/re-use information - indicates to the pump communication means to display on the operator panel whether the connected article is designed for re-use or for single use only.

(v) Duration of use information - this could either be in the form of the article in-use running hours or number of pressure time cycles per use or the actual times recorded when used. If this information is fed by the pump communication means back to the article communication means then it can be read by any pump communication means on subsequent usage. In this way users can be signalled when articles have reached the end of their operating life and for either clinical efficacy or safety reasons should no longer be used and whether user compliance of prescribed therapy has been administered. Also, the pump could be automatically shut-off or instructed to give appropriate warnings at the end of operating life/use.

(vi) Single Use Information - if the article communication means indicates application for single use only then the pump communication means can input in the

article communication means, an indication that the article has already been used. On subsequent attempts to use the article the pump communication means will recognise single use has occurred and not operate. In  
5 this case the clinical efficacy and safety of a single use article can be preserved automatically.

(vii) Limited or Multiple Re-use - if this is indicated within the article communication means then the pump communication means will automatically clock up the  
10 number of use cycles, put the information into the article communication means, and when the designed number of use cycles has been reached, the pump can automatically indicate this to the user so preserving clinical safety and efficacy.

(viii) Re-usable clinical articles after being re-processed (consequent to use to eliminate cross-contamination between users) - here the pump communication means looks for an indication from the article communication means that the article has been  
20 validly reprocessed between use cycles. This validity information is placed in the article communication means at the reprocessing facility using an approved piece of equipment. In this way only approved reprocessing which maintains clinical efficacy and safety will be accepted  
25 by the pump for use.

Another aspect of the invention provides for the use of the information exchange outlined above, in the field of intermittent compression therapy and pressure area care.

30 Therefore, a preferred embodiment of the invention provides a pneumatic control system including a pump and an inflatable/deflatable support for a patient to lie on,

control means to operate the pump, connection means for connecting the support and pump for fluid flow therethrough, wherein the pump and support have respective communication means, at least one said means  
5 capable of identifying the article and to instruct the pump control means to activate the pump accordingly.

Preferably, the said communication means are capable of exchanging information or energy to identify the support and to instruct the pump control means to operate  
10 the pump to provide a predetermined inflation/deflation of the support for a patient lying thereon. More preferably, the support communication means may be located within the connection means connecting the support to the pump.

15 A further preferred embodiment of the invention provides a pneumatic control system including a pump and at least one inflatable/deflatable garment to be wrapped around a user's limb, control means to operate the pump, connection means for connecting the garment and pump for  
20 fluid flow therethrough, wherein the pump and garment(s) have respective communication means, at least one said means capable of identifying the garment(s) and instructing the pump control means to activate the pump accordingly.

25 Preferably, the said communication means are capable of exchanging information or energy to identify the garment(s) and to instruct the pump control means to activate the pump accordingly and more preferably to further operate the pump to provide a predetermined  
30 inflation/deflation cycle of the garment(s) suited to the garments' application. Preferably, the garment

communication means may be located within the connection means connecting the garment to the pump.

The use of communication means to provide pressure area care and compression therapy will result in fewer individual pump models being required for the different care applications, all requiring differing pneumatic performance criteria and operator interfaces. This will lead both to manufacturing economies of scale and substantial acquisition, storage and inventory cost reductions, which is particularly beneficial within the cost sensitive and resource limited healthcare establishments where such care applications are generally used.

The communication means can be separately applied to pumps and to the garments and supports so long as the air delivery path configurations are functionally compatible. Thus pumps could operate such articles yet to be developed so long as the articles have their operating characteristics configured in a compatible communication means attached thereto.

In a healthcare environment this use of communication means prevents the inadvertent and unsafe operation of pump types with inflatable garments or supports e.g. pads or mattresses, which are not functionally safe or clinically compatible. A pump equipped with the communication means will readily deliver safe, effective therapy with a wide range of such inflatable articles.

The communication means of the present invention for information exchange between an article and a pump to control operation of the pump may comprise conventional read and write information systems; examples of which,

include bar code, magnetic stripe coding, insertion/rotation of co-operating connectors when connecting an article to the pump; geometry or intensity of magnetisation or transmissive or reflective optical path read by sensors; unique combinations of mechanical shapes read by mechanical switches or electronic memory chip with memory retention without power, for example, flash memory or EEPROM or UV EPROM.

Preferred embodiments of the present invention are described below, by way of example only, with reference to the accompanying drawings in which:

Figure 1 shows a schematic diagram of a communication means according to the present invention;

Figure 2 shows an alternative method of mounting one element of the communication means to that in Figure 1;

Figure 3 shows a typical radio communication means comprising a passive transponder and powering radio circuit; and

Figure 4 shows an alternative embodiment of a communication means.

Referring to Figure 1, the preferred embodiment consists of a pneumatic system consisting of a compression garment 21 connected to a pump 20 by a connector 10. The connector 10 has a connector part 11 connected to the pump 20 and a cooperating connector part 12 connected to the fluid line of the garment 21. The connector 12 carries a radio frequency identification device 30, i.e. a transponder. The transponder 30 is mounted on the connector part 12 connecting the compression garment 21 to the pump 20 and a corresponding radio circuit is located within the pump 20. The transponder 30 may be in the shape of an annular ring

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fitted to the connector part 12 surrounding its fluid line outlet or any suitable shape to fit on or adjacent the connector 12. The transponder 30 typically comprises a coil acting as an antennae to transmit and receive signals, a capacitor to temporarily store energy to power the transponder, an integrated circuit to provide control and modulation functions and a read/write electronic memory (EEPROM). The transponder 30 is used to transmit and receive information to and from the pump radio circuit 31. As shown in Figure 3, radio circuit 31 in the pump comprises coils located close to the pump outlet to provide for transponder power and two-way communication between the transponder 30 and the circuit 31. The transponder 30 is passive and does not need any power to store information. It is energised by coming into proximity with the coils of the radio circuit 31 in the pump 20 and can then communicate with the pump circuit 31. As the transponder 30 does not need power to store information there is no need for connection cables or batteries and it may be completely sealed after assembly, within connector part 12 attached to the compression article 21.

The communication between the transponder 30 and pump 20 is controlled by hardware and software within the pump.

The operation of the pump 20 is programmable, specifically the operation in terms of applied pressure and flow versus time profiles and alarm monitoring. This is achieved by having the key parameters which control this operation stored in the transponder 30 to be read by the radio circuit 31 in the pump 20 and used to operate the pump accordingly. Thus by changing the garment 21

the operation of the pump 20 may be changed and hence the pump 20 may be programmable by the garment 21.

The general approach is for the pump software to signal to the transponder via the radio link a request to transmit certain operational parameters. These are received by the pump radio link and used as a basis to operate the pump. For example, if the pressure is specified for the article then the pump will provide that particular pressure.

It is the information stored in the transponder within the connector on the article which indicates to the pump to operate accordingly.

Specific examples of parameters include:

Operating parameters - operating pressure level, pressure versus time inflation rate, pressure versus time deflation rate, duration of inflation, duration of period between inflation's.

Alarm parameters, the pressure at which an inflation characteristic is detected, time at which this is tested, number of fault conditions prior to alarm occurring. This would be duplicated for each alarm condition.

In use, the connector parts 11,12 are joined together. The transponder 30 within the garment connector part 12 when coming into the vicinity of the pump's radio circuit 31 is powered and responds by transmitting a signal to the pump radio circuit 31. The radio circuit 31 may request further information from the memory of the transponder 30 or it may modify some of the transponder memory 30. The pump 20 processes the information it has read from the transponder 30 and accordingly provides the specific inflation requirements for that garment 21.

The pump 20 is reconfigured after any break in its operation, for reasons of it being switched off, powered off or another garment being connected.

The radio circuit 31 reads the information within  
5 the transponder 30 memory on the connector part 12 of the garment 21 and identifies the garment 21 and if the information is compatible with that held within the pump 20 either electronically or within the software, then the pump operates the garment 21 according to the information  
10 transmitted by the transponder 30. In the case of single-use garments, the transponder memory 30 may contain additional control information which instructs the pump not to re-inflate or not to inflate after a certain time or any other parameter based decision process.  
15 Additionally, the radio circuit 31 may modify the transponder 30 memory to prevent further re-use of the garment 21 upon re-connection with the or another pump.

The pump 20 may be configured so that it is solely dependent on the transponder 30 memory to provide  
20 information regarding the inflation requirements of the garment 21 attached. This allows for new garments to be connected and operated by the pumps without the pumps' having to be upgraded.

The pump radio circuit 31 and transponder 30 could  
25 exchange information about the following:

The transponder 30 in the garment 21 could be used to store information about the pump's own operational history - e.g. time since last service, alarm history, degree of utilisation etc. This information could then be  
30 accessed by the manufacturer or its agents without physically having to gain access to the pump. This is an advantage where the pumps are spread widely



geographically or where access is restricted due to commercial reasons.

The opposite arrangement is also possible where the pump radio circuit 31 captures all the usage information stored within the garment transponder 30 (which could be a history involving many pumps). During servicing of the pump 20 the information is accessed as part of the service procedure.

This sort of information would allow better understanding of the actual pump/garment usage in healthcare establishments which may provide useful information for commercial, product reliability and quality and clinical efficacy purposes.

The facility to remotely upgrade the operation/disable use/enable use of the pump is possible.

The pump could include a transponder itself to self check that its own radio circuit 31 is working and further could be adapted to accommodate an external transponder 50. The transponder 50 may be in the form of a programming key which when connected to the pump 20, in the vicinity of the radio circuit 31 would specifically configure the operation of the pump 20 and garments 21 together as a system for a specific patient in a healthcare environment. This key could be configured by a physician for a particular patient's requirements. The key would override any existing settings stored in the pump and/or garments and ensure that the required pump operation occurred. Thus, improved patient compliance and increased product safety and efficacy would result. Other transponders or similar could be used to log operational data for maintenance purposes.

The pneumatic system above describes a pump 20 having a radio circuit 31 communicating with a radio frequency identification device (RFID) 30 on a connector 12 to a garment 21. The radio circuit 31 within the pump 5 20 also contains a phase detection circuit which can be used to detect any change of phase due to external influences and this principle may be employed as an alternative communication means for the pneumatic system.

A number of materials can be used to change the 10 phase of the coil 31, examples are shown in table 1.

Material	Phase Change in Degrees
Magnetically loaded plastic	+45
Torrid Core	+11
Amorphous metal strip	+50
Steel Core	-17
Cable screen ferrite 10mm	+62
Cable screen ferrite 5mm	+28
Brass Core	-22

In the case of brass the introduction into the coil field 31 lowers the phase detected by the phase detector, 15 and conversely the use of ferrite increases the phase detected, resulting in different values for differing materials. The phase angle change can be controlled by the amount of material within the coil field and by this method several identities can be detected.

20 Figure 4 shows an alternative system using the pump 20 as in Figure 1 and a connector 12 to a garment 21 (not shown), the connector 12 having communication means including an annular ring of ferrite 40 around the fluid line outlet.

In use, as shown in Figure 4a the connector parts 11, 12 are joined together. The ferrite 40 when coming into the vicinity of the pump's radio circuit 31 increases the phase detected by the phase detection  
5 circuit within the pump 20 and accordingly identifies the garment 21 (not shown) and if the phase change information is held to be compatible with the pump 20 either electronically or within the software, then the pump 20 may be operated to provide the therapy required.

10 While the preferred embodiments describe intermittent garments incorporating connectors having various types of communication means, it is understood that mattresses as well as any other inflatable/deflatable articles may be similarly connected and  
15 inflated/deflated using the same principles according to the invention. Moreover, the respective communication means within the article and the pump may be located elsewhere than the connectors as in the preferred embodiment, for example, within the inflatable article  
20 and/or pump casing. The preferred embodiments have described connectors using a means of information exchange or identification incorporating a radio frequency identification device (RFID) or ferrite material respectively, however any other forms of  
25 information exchange devices as discussed earlier or as would be apparent to those skilled in the art are within the scope of the invention.

Claims:

1. A pneumatic control system including a pump and at least one inflatable/deflatable article, control means  
5 for operation of the pump, connection means for connecting the article and pump for fluid flow therethrough, communication means provided on each of the pump and article, wherein upon connection between the pump and article at least one of said communication means  
10 capable of identifying the article and instructing the control means to activate the pump accordingly.
2. A pneumatic control system as claimed in claim 1, wherein the communication means are capable of exchanging  
15 information or energy so as to identify the article as that compatible to the pump and to instruct the pump control means to operate a predetermined inflation and/or deflation of the article by the pump accordingly.
- 20 3. A pneumatic control system as claimed in claims 1 or 2, wherein the communication means on the article is located within the connection means.
4. A pneumatic control system as claimed in claims 1, 2  
25 or 3, wherein during use the respective communication means do not contact each other.
5. A pneumatic control system including a pump and an inflatable/deflatable support for a patient to lie on,  
30 control means to operate the pump, connection means for connecting the support and pump for fluid flow therethrough, wherein the pump and support have

respective communication means, at least one said communication means capable of identifying the article and to instruct the pump control means to activate the pump accordingly.

5

6. A pneumatic control system as claimed in claim 5, wherein the said communication means are capable of exchanging information or energy to identify the support and to instruct the pump control means to operate the pump to provide a predetermined inflation/deflation of the support for a patient lying thereon.

7. A pneumatic control system as claimed in claim 5 or 6, wherein the support communication means may be located within the connection means connecting the support to the pump.

8. A pneumatic control system including a pump and at least one inflatable/deflatable garment to be wrapped around a user's limb, control means to operate the pump, connection means for connecting the garment and pump for fluid flow therethrough, wherein the pump and garment(s) have respective communication means, at least one of said communication means capable of identifying the garment(s) and instructing the pump control means to activate the pump accordingly.

9. A pneumatic control system as claimed in claim 8, wherein the said communication means are capable of exchanging information or energy to identify the garment(s) and to instruct the pump control means to activate the pump accordingly and to instruct the pump to

control means to operate the pump to provide a predetermined inflation/deflation cycle of the garment(s) suited to the garments' application.

10. A pneumatic control system as claimed in claim 8 or 9, wherein the garment communication means may be located within the connection means connecting the garment to the pump.

10

Fig.1.

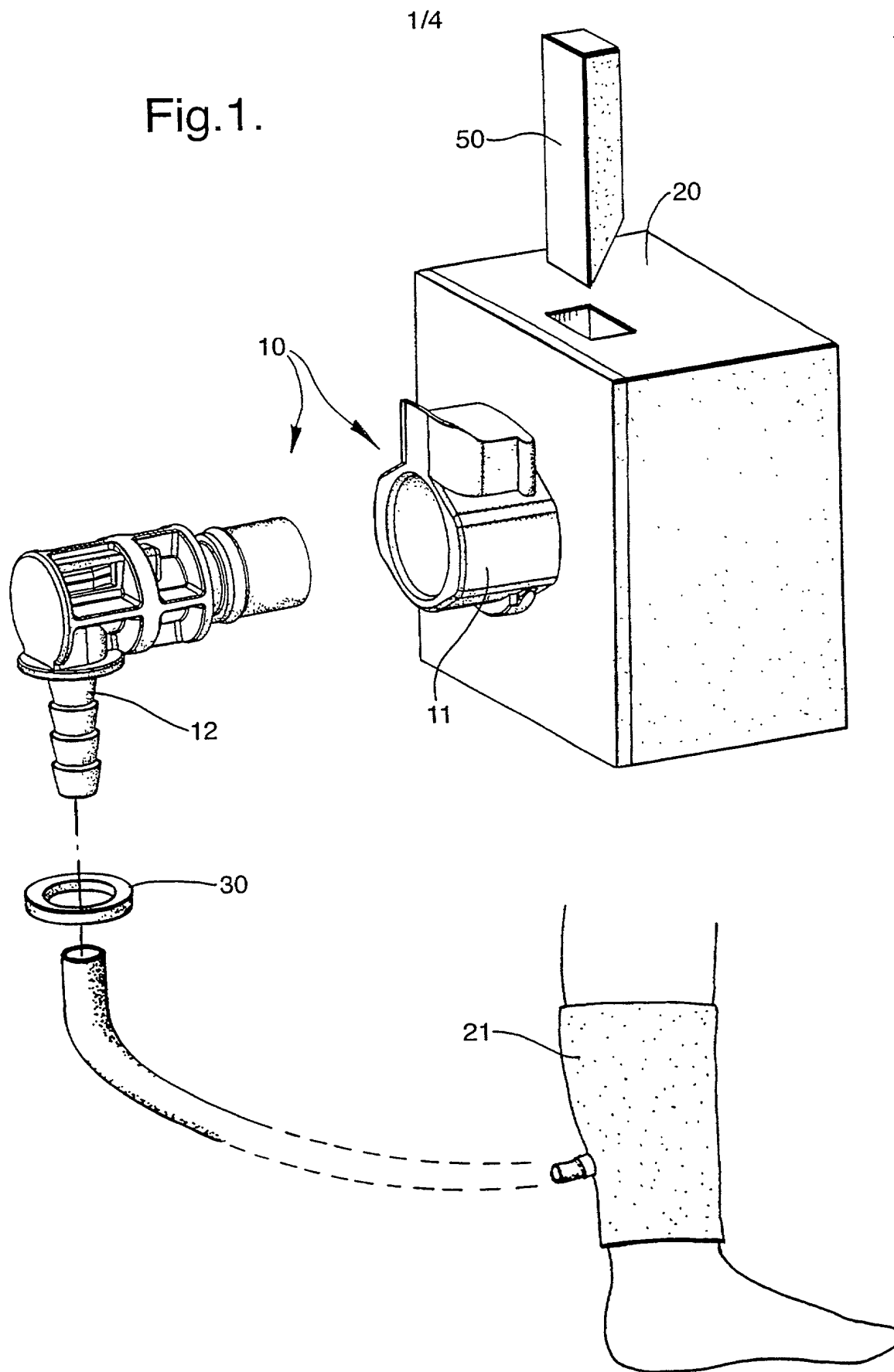


Fig.2.

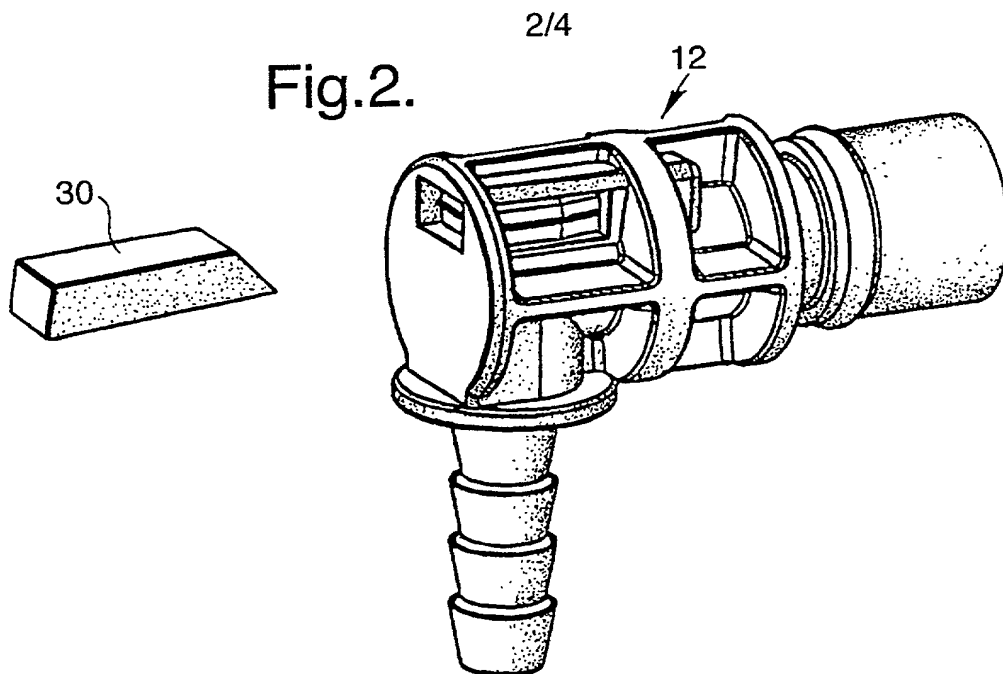


Fig.4a.

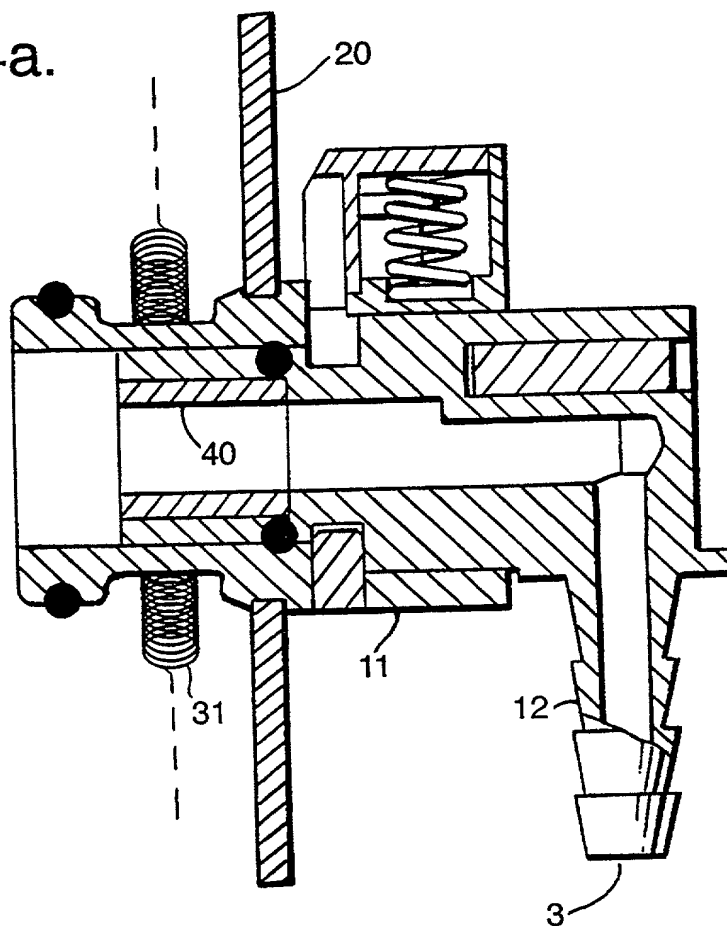




Fig.3.

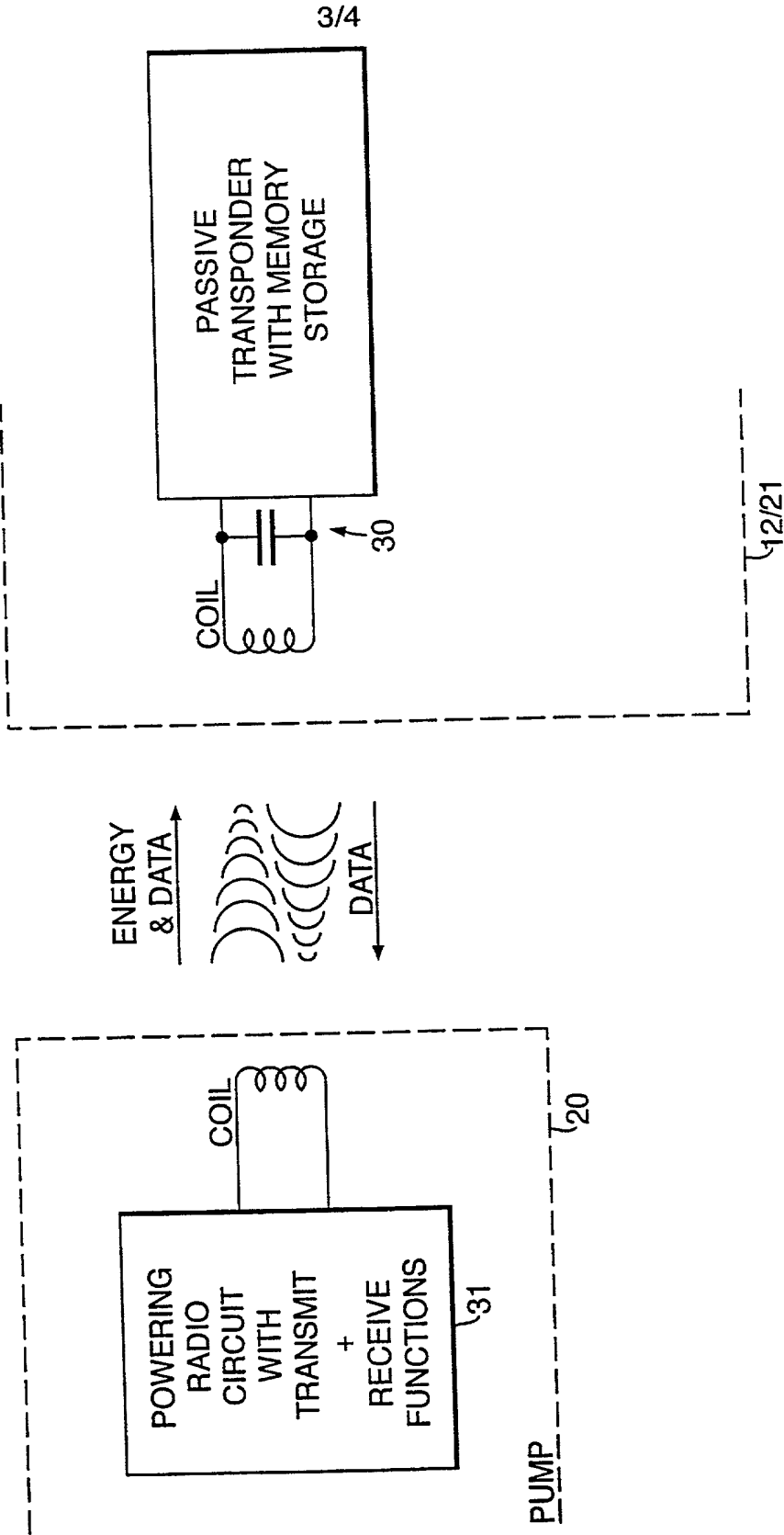
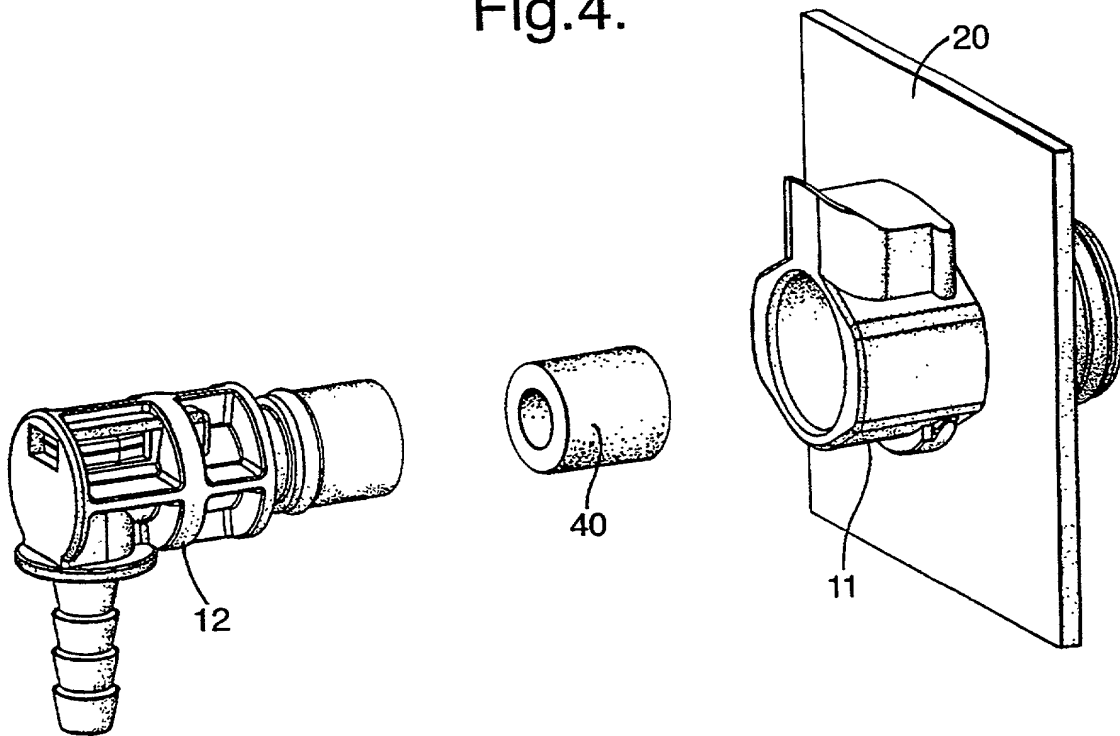


Fig.4.





DECLARATION AND POWER OF ATTORNEY  
FOR PATENT APPLICATION

(COMPLETE IF KNOWN)

Application Number	09/509,265
Filing Date	03/30/2000
Group Art Unit	To be assigned
Examiner	Not yet known

Attorney Docket Number	3315/23
First Named Inventor	NEWTON

This declaration is (check one):

- ☐ submitted with initial filing;  
☒ submitted after initial filing;  
☐ a supplemental declaration.

This application is of the following type:

- ☐ utility;  
☐ design;  
☒ national stage of PCT;  
☐ divisional, continuation or continuation-in-part.



As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

IDENTIFICATION AND COMMUNICATION SYSTEM  
FOR INFLATABLE DEVICES

the specification of which: (check one)

- ☐ is attached hereto; or  
☐ was filed on \_\_\_\_\_ as U.S. Application Serial No. \_\_\_\_\_ and is/was amended on \_\_\_\_\_ (if applicable);  
☒ was described and claimed in PCT International Application No. PCT/GB99/02403, filed on July 23, 1999 and was amended under PCT Article 19 on \_\_\_\_\_ (if applicable).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, §1.56.

I hereby identify below, and where indicated claim foreign priority benefits under Title 35, United States Code §§ 119(a)-(d) or §§ 365(a)-(b) of any foreign application(s) for patent or inventor's certificate or of any PCT international application(s) designating at least one country other than the United States of America, filed within 12 months (6 months for design) prior to this application, and have also identified below any foreign application(s) for patent or inventor's

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98/16173.0	Great Britain	07/25/1998 ✓	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
			<input type="checkbox"/> Yes	<input type="checkbox"/> No
			<input type="checkbox"/> Yes	<input type="checkbox"/> No

I hereby claim the benefit under Title 35, United States Code, §119(c) of any United States provisional application(s) listed below (if any):

Provisional Application No.	Filing Date

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U.S./PCT Parent Application No.	Filing Date	Status (Patented, Pending, or Abandoned)
PCT/GB99/02403	07/23/1999 ✓	Pending

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

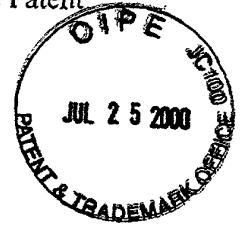


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As a named inventor, I hereby appoint the following attorney(s) or agent(s) with full power of substitution and revocation to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith:

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